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SEQUENCE LISTING

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<110> The Government of the United States of America as
      represented by the Secretary of the Department of Health and
      Human Services
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      Zeldin, Darryl C.
      Graves, Joan P.
      Stumpo, Deborah J.

<120> COMPOSITIONS AND METHODS FOR DIAGNOSTICS AND THERAPEUTICS FOR
      HYDROCEPHALUS

<130> 4239-64828

<150> 60/374,184
<151> 2002-04-19

<150> 60/388,266
<151> 2002-06-13

<160> 39

<170> PatentIn version 3.2

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Lys Asn Asp Thr Gln Pro Val Asn Ala Ala Ser Phe Gly Lys Ile Ile	
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Gln Ser Lys Tyr His Tyr Tyr Gly Ile Ala Val Lys Glu Ser Ser Gln	
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Tyr Tyr Asp Val Met Tyr Ser Lys Lys Gly Ala Ala Trp Val Ser Glu	
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tac acc atg gaa gac tct cgc gat gag cac cgg aaa ctc atc acc caa Tyr Thr Met Glu Asp Ser Arg Asp Glu His Arg Lys Leu Ile Thr Gln 375 380 385	1269
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Glu Ser Glu Asn Lys Arg Tyr Ser Ser His Thr Ser Leu Gly Asn Val
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Ser Asn Asp Glu Asn Glu Glu Lys Glu Asn Asn Arg Ala Ser Lys Pro
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His Ser Thr Pro Ala Thr Leu Gln Trp Leu Glu Glu Asn Tyr Glu Ile
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Ala Glu Gly Val Cys Ile Pro Arg Ser Ala Leu Tyr Met His Tyr Leu
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Asp Phe Cys Glu Lys Asn Asp Thr Gln Pro Val Asn Ala Ala Ser Phe
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Gly Lys Ile Ile Arg Gln Gln Phe Pro Gln Leu Thr Thr Arg Arg Leu
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Gly Thr Arg Gly Gln Ser Lys Tyr His Tyr Tyr Gly Ile Ala Val Lys
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Trp Val Ser Glu Thr Gly Lys Lys Glu Val Ser Lys Gln Thr Val Ala
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 180 185 190

Val Lys Asp Leu Asn Leu Pro Ala Ser Leu Pro Glu Glu Lys Val Ser
 195 200 205

Thr Phe Ile Met Met Tyr Arg Thr His Cys Gln Arg Ile Leu Asp Thr
 210 215 220

Val Ile Arg Ala Asn Phe Asp Glu Val Gln Ser Phe Leu Leu His Phe
 225 230 235 240

Trp Gln Gly Met Pro Pro His Met Leu Pro Val Leu Gly Ser Ser Thr
 245 250 255

Val Val Asn Ile Val Gly Val Cys Asp Ser Ile Leu Tyr Lys Ala Ile
 260 265 270

Ser Gly Val Leu Met Pro Thr Val Leu Gln Ala Leu Pro Asp Ser Leu
 275 280 285

Thr Gln Val Ile Arg Lys Phe Ala Lys Gln Leu Asp Glu Trp Leu Lys
 290 295 300

Val Ala Leu His Asp Leu Pro Glu Asn Leu Arg Asn Ile Lys Phe Glu
 305 310 315 320

Leu Ser Arg Arg Phe Ser Gln Ile Leu Arg Arg Gln Thr Ser Leu Asn
 325 330 335

His Leu Cys Gln Ala Ser Arg Thr Val Ile His Ser Ala Asp Ile Thr
 340 345 350

Phe Gln Met Leu Glu Asp Trp Arg Asn Val Asp Leu Asn Ser Ile Thr
 355 360 365

Lys Gln Thr Leu Tyr Thr Met Glu Asp Ser Arg Asp Glu His Arg Lys
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                                         1
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Asp	Ser	Arg	Cys	Pro	Leu	Ser	Arg	Asn	Ile	Thr	Glu	Trp	Tyr	His	Tyr		
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tat	ggc	att	gca	gtg	aaa	gaa	agc	tcc	caa	tat	tat	gat	gtg	atg	tat	262	
Tyr	Gly	Ile	Ala	Val	Lys	Glu	Ser	Ser	Gln	Tyr	Tyr	Asp	Val	Met	Tyr		
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Ser	Lys	Lys	Gly	Ala	Ala	Trp	Val	Ser	Glu	Thr	Gly	Lys	Lys	Glu	Val		
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Ser	Lys	Gln	Thr	Val	Ala	Tyr	Ser	Pro	Arg	Ser	Lys	Leu	Gly	Thr	Leu		
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Leu	Pro	Glu	Phe	Pro	Asn	Val	Lys	Asp	Leu	Asn	Leu	Pro	Ala	Ser	Leu		
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cct	gag	gag	aag	gtt	tct	acc	ttt	att	atg	atg	tac	aga	aca	cac	tgt	454	
Pro	Glu	Glu	Lys	Val	Ser	Thr	Phe	Ile	Met	Met	Tyr	Arg	Thr	His	Cys		
100					105					110					115		
cag	aga	ata	ctg	gac	act	gta	ata	aga	gcc	aac	ttt	gat	gag	gtt	caa	502	
Gln	Arg	Ile	Leu	Asp	Thr	Val	Ile	Arg	Ala	Asn	Phe	Asp	Glu	Val	Gln		
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agt	ttc	ctt	ctg	cac	ttt	tgg	caa	gga	atg	ccg	ccc	cac	atg	ctg	cct	550	
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Val	Leu	Gly	Ser	Ser	Thr	Val	Val	Asn	Ile	Val	Gly	Val	Cys	Asp	Ser		
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atc	ctc	tac	aaa	gct	atc	tcc	ggg	gtg	ctg	atg	ccc	act	gtg	ctg	cag	646	
Ile	Leu	Tyr	Lys	Ala	Ile	Ser	Gly	Val	Leu	Met	Pro	Thr	Val	Leu	Gln		
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Ala	Leu	Pro	Asp	Ser	Leu	Thr	Gln	Val	Ile	Arg	Lys	Phe	Ala	Lys	Gln		
180					185					190					195		
ctg	gat	gag	tgg	cta	aaa	gtg	gct	ctc	cac	gac	ctc	cca	gaa	aac	ttg	742	
Leu	Asp	Glu	Trp	Leu	Lys	Val	Ala	Leu	His	Asp	Leu	Pro	Glu	Asn	Leu		
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Arg	Gln	Thr	Ser	Leu	Asn	His	Leu	Cys	Gln	Ala	Ser	Arg	Thr	Val	Ile		
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cac	agt	gca	gac	atc	acg	ttc	caa	atg	ctg	gaa	gac	tgg	agg	aac	gtg	886	
His	Ser	Ala	Asp	Ile	Thr	Phe	Gln	Met	Leu	Glu	Asp	Trp	Arg	Asn	Val		

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Tyr His Tyr Tyr Gly Ile Ala Val Lys Glu Ser Ser Gln Tyr Tyr Asp
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 50 55 60

Lys Glu Val Ser Lys Gln Thr Val Ala Tyr Ser Pro Arg Ser Lys Leu
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Gly Thr Leu Leu Pro Glu Phe Pro Asn Val Lys Asp Leu Asn Leu Pro
 85 90 95

Ala Ser Leu Pro Glu Glu Lys Val Ser Thr Phe Ile Met Met Tyr Arg
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Thr His Cys Gln Arg Ile Leu Asp Thr Val Ile Arg Ala Asn Phe Asp
 115 120 125

Glu Val Gln Ser Phe Leu Leu His Phe Trp Gln Gly Met Pro Pro His
 130 135 140

Met Leu Pro Val Leu Gly Ser Ser Thr Val Val Asn Ile Val Gly Val
 145 150 155 160

Cys Asp Ser Ile Leu Tyr Lys Ala Ile Ser Gly Val Leu Met Pro Thr
 165 170 175

Val Leu Gln Ala Leu Pro Asp Ser Leu Thr Gln Val Ile Arg Lys Phe
 180 185 190

Ala Lys Gln Leu Asp Glu Trp Leu Lys Val Ala Leu His Asp Leu Pro
 195 200 205

Glu Asn Leu Arg Asn Ile Lys Phe Glu Leu Ser Arg Arg Phe Ser Gln
 210 215 220

Ile Leu Arg Arg Gln Thr Ser Leu Asn His Leu Cys Gln Ala Ser Arg
 225 230 235 240

Thr Val Ile His Ser Ala Asp Ile Thr Phe Gln Met Leu Glu Asp Trp
 245 250 255

Arg Asn Val Asp Leu Asn Ser Ile Thr Lys Gln Thr Leu Tyr Thr Met
 260 265 270

Glu Asp Ser Arg Asp Glu His Arg Lys Leu Ile Thr Gln Leu Tyr Gln
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Glu Phe Asp His Leu Leu Glu Glu Gln Ser Pro Ile Glu Ser Tyr Ile
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Lys Arg Arg Gly Ser Leu Lys Lys Val Ala Gln Gln Phe Leu Leu Met
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Trp Ser Cys Phe Gly Thr Arg Val Ile Arg Asp Met Thr Leu His Ser
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Ala Pro Ser Phe Gly Ser Phe His Leu Ile His Leu Met Phe Asp Asp
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Tyr Val Leu Tyr Leu Leu Glu Ser Leu His Cys Gln Glu Arg Ala Asn
 370 375 380

Glu Leu Met Arg Ala Met Lys Gly Glu Gly Ser Thr Ala Glu Val Arg
 385 390 395 400

Glu Glu Ile Ile Leu Thr Glu Ala Ala Ala Pro Thr Pro Ser Pro Val
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Pro Ser Phe Ser Pro Ala Lys Ser Ala Thr Ser Val Glu Val Pro Pro
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Pro Ser Ser Pro Val Ser Asn Pro Ser Pro Glu Tyr Thr Gly Leu Ser
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Thr Thr Gly Ala Met Gln Ala Tyr Thr Trp Ser Leu Thr Tyr Thr Val
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Met Arg Asn Thr His Val Pro Ser Ser Ser Val Thr His Arg Ile Pro
 485 490 495

Val Tyr Pro His Arg Glu Glu His Gly Tyr Thr Gly Ser Tyr Asn Tyr
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Gly Ser Tyr Gly Asn Gln His Pro His Pro Met Gln Ser Gln Tyr Pro
 515 520 525

Ala Leu Pro His Asp Thr Ala Ile Ser Gly Pro Leu His Tyr Ala Pro
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Tyr His Arg Ser Ser Ala Gln Tyr Pro Phe Asn Ser Pro Thr Ser Arg
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Met Glu Pro Cys Leu Met Ser Ser Thr Pro Arg Leu His Pro Thr Pro
 565 570 575

Val Thr Pro Arg Trp Pro Glu Val Pro Ser Ala Asn Thr Cys Tyr Thr
 580 585 590

Asn Pro Ser Val His Ser Ala Arg Tyr Gly Asn Ser Ser Asp Met Tyr
 595 600 605

Thr Pro Leu Thr Thr Arg Arg Asn Ser Glu Tyr Glu His Met Gln His

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 aagagc atg cat tgt ggg tta ctg gag gaa ccc gac atg gat tcc aca 348
 Met His Cys Gly Leu Leu Glu Glu Pro Asp Met Asp Ser Thr
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 gag agc tgg att gaa aga tgt ctc aat gaa agc gag aat aaa cgc tat 396
 Glu Ser Trp Ile Glu Arg Cys Leu Asn Glu Ser Glu Asn Lys Arg Tyr
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 tcc agt cac aca tct ctg ggg aat gtg tct aat gat gaa aat gag gaa 444
 Ser Ser His Thr Ser Leu Gly Asn Val Ser Asn Asp Glu Asn Glu Glu
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 aaa gaa aat aac aga gca tcc aag ccc cac tcc acg ccg gcc acc ctg 492
 Lys Glu Asn Asn Arg Ala Ser Lys Pro His Ser Thr Pro Ala Thr Leu
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 caa tgg ctg gag gaa aac tat gag att gct gag ggc gtc tgc atc ccc 540
 Gln Trp Leu Glu Glu Asn Tyr Glu Ile Ala Glu Gly Val Cys Ile Pro
 65 70 75
 cgc agc gcc ctc tac atg cac tac ctg gat ttc tgt gag aag aac gac 588
 Arg Ser Ala Leu Tyr Met His Tyr Leu Asp Phe Cys Glu Lys Asn Asp
 80 85 90
 act cag cct gtc aat gct gcc agc ttt ggg aag atc ata agg cag cag 636
 Thr Gln Pro Val Asn Ala Ala Ser Phe Gly Lys Ile Ile Arg Gln Gln
 95 100 105 110
 ttt cct cag cta acc acc aga aga ctc ggg acc ggg acc cga gga cag 684

Phe Pro Gln Leu Thr Thr Arg Arg Leu Gly Thr Gly Thr Arg Gly Gln	
115 120 125	
tca aag tac cat tac tat ggc ata gcg gtg aag gag agc tcc cag tat	732
Ser Lys Tyr His Tyr Tyr Gly Ile Ala Val Lys Glu Ser Ser Gln Tyr	
130 135 140	
tat gat gtg atg tac tca aag aaa gga gct gcc tgg gtg agc gag acg	780
Tyr Asp Val Met Tyr Ser Lys Lys Gly Ala Ala Trp Val Ser Glu Thr	
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ggc aag aga gaa gtc acc aag cag acg gtg gca tat tct ccc cgg tcc	828
Gly Lys Arg Glu Val Thr Lys Gln Thr Val Ala Tyr Ser Pro Arg Ser	
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aag ctt ggg aca ttg ctg cca gac ttt cca aac gtc aaa gac cta aat	876
Lys Leu Gly Thr Leu Leu Pro Asp Phe Pro Asn Val Lys Asp Leu Asn	
175 180 185 190	
ctg cca gcc agt ctt cct gag gag aag gtg tct acc ttt att atg atg	924
Leu Pro Ala Ser Leu Pro Glu Glu Lys Val Ser Thr Phe Ile Met Met	
195 200 205	
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Tyr Arg Thr His Cys Gln Arg Ile Leu Asp Thr Val Ile Arg Ala Asn	
210 215 220	
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Phe Asp Glu Val Gln Ser Phe Leu Leu His Phe Trp Gln Gly Met Pro	
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ccc cac atg ctg ccc gtg cta ggc tcc tcc acg gtg gtg aac atc gtg	1068
Pro His Met Leu Pro Val Leu Gly Ser Ser Thr Val Val Asn Ile Val	
240 245 250	
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Gly Val Cys Asp Ser Ile Leu Tyr Lys Ala Ile Ser Gly Val Leu Met	
255 260 265 270	
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Pro Thr Val Leu Gln Ala Leu Pro Asp Ser Leu Thr Gln Val Ile Arg	
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Lys Phe Ala Lys Gln Leu Asp Glu Trp Leu Lys Val Ala Leu His Asp	
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ctc ccg gaa aac ctg aga aac atc aaa ttt gaa tta tca agg agg ttt	1260
Leu Pro Glu Asn Leu Arg Asn Ile Lys Phe Glu Leu Ser Arg Arg Phe	
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Ser Gln Ile Leu Arg Arg Gln Thr Ser Leu Asn His Leu Cys Gln Ala	
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tct cga acg gtg atc cac agt gca gac atc acg ttc cag atg ctg gag	1356
Ser Arg Thr Val Ile His Ser Ala Asp Ile Thr Phe Gln Met Leu Glu	
335 340 345 350	
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Asp Trp Arg Asn Val Asp Leu Ser Ser Ile Thr Lys Gln Thr Leu Tyr	

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acc	atg	gag	gac	tct	cgg	gat	gag	cac	cgc	aga	ctc	atc	atc	cag	ttg					1452
Thr	Met	Glu	Asp	Ser	Arg	Asp	Glu	His	Arg	Arg	Leu	Ile	Ile	Gln	Leu					
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tac	cag	gag	ttt	gac	cac	ctg	ctg	gag	gaa	cag	tcc	ccc	atc	gag	tct					1500
Tyr	Gln	Glu	Phe	Asp	His	Leu	Leu	Glu	Glu	Gln	Ser	Pro	Ile	Glu	Ser					
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Tyr	Ile	Glu	Trp	Leu	Asp	Thr	Met	Val	Asp	Arg	Cys	Val	Val	Lys	Val					
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gct	gcc	aag	aga	caa	ggg	tct	ctg	aag	aaa	gta	gcc	caa	cag	ttc	ctg					1596
Ala	Ala	Lys	Arg	Gln	Gly	Ser	Leu	Lys	Lys	Val	Ala	Gln	Gln	Phe	Leu					
415				420				425				430								
ctg	atg	tgg	tct	tgc	ttt	ggg	acg	agg	gtg	atc	cgg	gac	atg	acc	ttg					1644
Leu	Met	Trp	Ser	Cys	Phe	Gly	Thr	Arg	Val	Ile	Arg	Asp	Met	Thr	Leu					
				435				440				445								
cac	agt	gcc	ccc	agc	ttc	ggg	tct	ttt	cac	ctg	att	cac	ctg	atg	ttc					1692
His	Ser	Ala	Pro	Ser	Phe	Gly	Ser	Phe	His	Leu	Ile	His	Leu	Met	Phe					
450								455				460								
gac	gac	tac	gtg	ctc	tac	ttg	cta	gaa	tct	ctg	cat	tgt	cag	gag	cgg					1740
Asp	Asp	Tyr	Val	Leu	Tyr	Leu	Leu	Glu	Ser	Leu	His	Cys	Gln	Glu	Arg					
465								470				475								
gcc	aac	gag	ctc	atg	cga	gcc	atg	aaa	gga	gaa	gga	agc	act	gca	gaa					1788
Ala	Asn	Glu	Leu	Met	Arg	Ala	Met	Lys	Gly	Glu	Gly	Ser	Thr	Ala	Glu					
480								485				490								
gcc	cag	gaa	gag	att	atc	ttg	aca	gag	gct	acc	cca	cca	acc	cct	tca					1836
Ala	Gln	Glu	Glu	Ile	Ile	Leu	Thr	Glu	Ala	Thr	Pro	Pro	Thr	Pro	Ser					
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cct	ggg	cca	tca	ttt	tct	cca	gca	aag	tct	gcc	aca	tct	gtg	gag	gtg					1884
Pro	Gly	Pro	Ser	Phe	Ser	Pro	Ala	Lys	Ser	Ala	Thr	Ser	Val	Glu	Val					
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cca	cct	ccc	tcc	tcc	cct	gtc	agc	aac	cca	tcc	ccc	gaa	tac	act	ggc					1932
Pro	Pro	Pro	Ser	Ser	Pro	Val	Ser	Asn	Pro	Ser	Pro	Glu	Tyr	Thr	Gly					
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ctt	agc	aca	gca	gga	gcg	atg	cag	tca	tat	acg	tgg	tcg	cta	aca	tat					1980
Leu	Ser	Thr	Ala	Gly	Ala	Met	Gln	Ser	Tyr	Thr	Trp	Ser	Leu	Thr	Tyr					
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aca	gta	aca	acg	gct	gca	ggg	tca	ccg	gct	gag	aac	tcc	caa	caa	cta					2028
Thr	Val	Thr	Thr	Ala	Ala	Gly	Ser	Pro	Ala	Glu	Asn	Ser	Gln	Gln	Leu					
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aac tac ggg agc tat ggc aac cag cat cct cac cca ctg cag aac cag 2172
 Asn Tyr Gly Ser Tyr Gly Asn Gln His Pro His Pro Leu Gln Asn Gln
 610 615 620

tat cca gcc ttg cct cat gac aca gcc atc tct ggg cct ctc cac tat 2220
 Tyr Pro Ala Leu Pro His Asp Thr Ala Ile Ser Gly Pro Leu His Tyr
 625 630 635

tcc cct tac cac agg agc tct gcc cag tac cct ttc aat agc ccc act 2268
 Ser Pro Tyr His Arg Ser Ser Ala Gln Tyr Pro Phe Asn Ser Pro Thr
 640 645 650

tcc agg atg gaa cct tgt ttg atg agc agt act ccc agg ctg cat cct 2316
 Ser Arg Met Glu Pro Cys Leu Met Ser Ser Thr Pro Arg Leu His Pro
 655 660 665 670

acc cca gtg act ccc cga tgg cca gag gtg ccg act gcc aac gca tgc 2364
 Thr Pro Val Thr Pro Arg Trp Pro Glu Val Pro Thr Ala Asn Ala Cys
 675 680 685

tac aca agc cca tct gtg cat tcc acg agg tat gga aac tct agt gac 2412
 Tyr Thr Ser Pro Ser Val His Ser Thr Arg Tyr Gly Asn Ser Ser Asp
 690 695 700

atg tac acc ccg ctg acc acg cgc agg aat tct gag tat gag cac atg 2460
 Met Tyr Thr Pro Leu Thr Thr Arg Arg Asn Ser Glu Tyr Glu His Met
 705 710 715

caa cac ttt cct ggc ttt gct tac atc aac gga gag gcc tcc act gga 2508
 Gln His Phe Pro Gly Phe Ala Tyr Ile Asn Gly Glu Ala Ser Thr Gly
 720 725 730

tgg gct aag tga ctgctttcat agaaatccat atttaatat aataattaat 2560
 Trp Ala Lys
 735

aataataata aaccagctac ccaccctcca gaagacttta tttcaatata tcataacttg 2620

cgggctgacc taagcatcca ttctcctaata gaacaagagg atgttcaatg tggagtgaat 2680

agacttttagt tcagaaacag gagtcactaa aagtcagtgg gattggggtt ctgtagccaa 2740

gccagacttg actgttttcta tagagcacta tcttgggcag gccaatctgt gcctttcccc 2800

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 35 40 45

Asn Asn Arg Ala Ser Lys Pro His Ser Thr Pro Ala Thr Leu Gln Trp
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Leu Glu Glu Asn Tyr Glu Ile Ala Glu Gly Val Cys Ile Pro Arg Ser
 65 70 75 80

Ala Leu Tyr Met His Tyr Leu Asp Phe Cys Glu Lys Asn Asp Thr Gln
 85 90 95

Pro Val Asn Ala Ala Ser Phe Gly Lys Ile Ile Arg Gln Gln Phe Pro
 100 105 110

Gln Leu Thr Thr Arg Arg Leu Gly Thr Gly Thr Arg Gly Gln Ser Lys
 115 120 125

Tyr His Tyr Tyr Gly Ile Ala Val Lys Glu Ser Ser Gln Tyr Tyr Asp
 130 135 140

Val Met Tyr Ser Lys Lys Gly Ala Ala Trp Val Ser Glu Thr Gly Lys
 145 150 155 160

Arg Glu Val Thr Lys Gln Thr Val Ala Tyr Ser Pro Arg Ser Lys Leu
 165 170 175

Gly Thr Leu Leu Pro Asp Phe Pro Asn Val Lys Asp Leu Asn Leu Pro
 180 185 190

Ala Ser Leu Pro Glu Glu Lys Val Ser Thr Phe Ile Met Met Tyr Arg
 195 200 205

Thr His Cys Gln Arg Ile Leu Asp Thr Val Ile Arg Ala Asn Phe Asp
 210 215 220

Glu Val Gln Ser Phe Leu Leu His Phe Trp Gln Gly Met Pro Pro His
 225 230 235 240

Met Leu Pro Val Leu Gly Ser Ser Thr Val Val Asn Ile Val Gly Val
 245 250 255

Cys Asp Ser Ile Leu Tyr Lys Ala Ile Ser Gly Val Leu Met Pro Thr
 260 265 270

Val Leu Gln Ala Leu Pro Asp Ser Leu Thr Gln Val Ile Arg Lys Phe
 275 280 285

Ala Lys Gln Leu Asp Glu Trp Leu Lys Val Ala Leu His Asp Leu Pro
 290 295 300

Glu Asn Leu Arg Asn Ile Lys Phe Glu Leu Ser Arg Arg Phe Ser Gln
 305 310 315 320

Ile Leu Arg Arg Gln Thr Ser Leu Asn His Leu Cys Gln Ala Ser Arg
 325 330 335

Thr Val Ile His Ser Ala Asp Ile Thr Phe Gln Met Leu Glu Asp Trp
 340 345 350

Arg Asn Val Asp Leu Ser Ser Ile Thr Lys Gln Thr Leu Tyr Thr Met
 355 360 365

Glu Asp Ser Arg Asp Glu His Arg Arg Leu Ile Ile Gln Leu Tyr Gln
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Glu Phe Asp His Leu Leu Glu Glu Gln Ser Pro Ile Glu Ser Tyr Ile
 385 390 395 400

Glu Trp Leu Asp Thr Met Val Asp Arg Cys Val Val Lys Val Ala Ala
 405 410 415

Lys Arg Gln Gly Ser Leu Lys Lys Val Ala Gln Gln Phe Leu Leu Met
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Trp Ser Cys Phe Gly Thr Arg Val Ile Arg Asp Met Thr Leu His Ser
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Ala Pro Ser Phe Gly Ser Phe His Leu Ile His Leu Met Phe Asp Asp
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Tyr Val Leu Tyr Leu Leu Glu Ser Leu His Cys Gln Glu Arg Ala Asn
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Glu Leu Met Arg Ala Met Lys Gly Glu Gly Ser Thr Ala Glu Ala Gln
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Glu Glu Ile Ile Leu Thr Glu Ala Thr Pro Pro Thr Pro Ser Pro Gly
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Pro Ser Phe Ser Pro Ala Lys Ser Ala Thr Ser Val Glu Val Pro Pro
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 Val Thr Pro Arg Trp Pro Glu Val Pro Thr Ala Asn Ala Cys Tyr Thr
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Lys

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 Met His Cys Gly Leu Leu Glu Glu Pro Asp Met Asp Ser Thr
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 Glu Ser Trp Ile Glu Arg Cys Leu Asn Glu Ser Glu Asn Lys Arg Tyr
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 Ser Ser His Thr Ser Leu Gly Asn Val Ser Asn Asp Glu Asn Glu Glu
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 Lys Glu Asn Asn Arg Ala Ser Lys Pro His Ser Thr Pro Ala Thr Leu
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 Arg Ser Ala Leu Tyr Met His Tyr Leu Asp Phe Cys Glu Lys Asn Asp
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 Phe Pro Gln Leu Thr Thr Arg Arg Leu Gly Thr Arg Gly Gln Ser Lys
 115 120 125
 tac cat tac tat ggc att gca gtg aaa gaa agc tcc caa tat tat gat 493
 Tyr His Tyr Tyr Gly Ile Ala Val Lys Glu Ser Ser Gln Tyr Tyr Asp
 130 135 140
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 Val Met Tyr Ser Lys Lys Gly Ala Ala Trp Val Ser Glu Thr Gly Lys
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 aaa gaa gtg agc aaa cag aca gtg gca tat tca ccc cgg tcc aaa ctc 589
 Lys Glu Val Ser Lys Gln Thr Val Ala Tyr Ser Pro Arg Ser Lys Leu
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 gga aca ctg ctg cca gaa ttt ccc aat gtc aaa gat cta aat ctg cca 637
 Gly Thr Leu Leu Pro Glu Phe Pro Asn Val Lys Asp Leu Asn Leu Pro
 175 180 185 190
 gcc agc ctg cct gag gag aag gtt tct acc ttt att atg atg tac aga 685

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Thr	His	Cys	Gln	Arg	Ile	Leu	Asp	Thr	Val	Ile	Arg	Ala	Asn	Phe	Asp	
			210					215					220			
gag	gtt	caa	agt	ttc	ctt	ctg	cac	ttt	tgg	caa	gga	atg	ccg	ccc	cac	781
Glu	Val	Gln	Ser	Phe	Leu	Leu	His	Phe	Trp	Gln	Gly	Met	Pro	Pro	His	
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atg	ctg	cct	gtg	ctg	ggc	tcc	tcc	acg	gtg	gtg	aac	att	gtc	ggc	gtg	829
Met	Leu	Pro	Val	Leu	Gly	Ser	Ser	Thr	Val	Val	Asn	Ile	Val	Gly	Val	
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Cys	Asp	Ser	Ile	Leu	Tyr	Lys	Ala	Ile	Ser	Gly	Val	Leu	Met	Pro	Thr	
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gtg	ctg	cag	gca	tta	cct	gac	agc	tta	act	cag	gtg	att	cga	aag	ttt	925
Val	Leu	Gln	Ala	Leu	Pro	Asp	Ser	Leu	Thr	Gln	Val	Ile	Arg	Lys	Phe	
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gcc	aag	caa	ctg	gat	gag	tgg	cta	aaa	gtg	gct	ctc	cac	gac	ctc	cca	973
Ala	Lys	Gln	Leu	Asp	Glu	Trp	Leu	Lys	Val	Ala	Leu	His	Asp	Leu	Pro	
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Glu	Asn	Leu	Arg	Asn	Ile	Lys	Phe	Glu	Leu	Ser	Arg	Arg	Phe	Ser	Gln	
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Ile	Leu	Arg	Arg	Gln	Thr	Ser	Leu	Asn	His	Leu	Cys	Gln	Ala	Ser	Arg	
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Thr	Val	Ile	His	Ser	Ala	Asp	Ile	Thr	Phe	Gln	Met	Leu	Glu	Asp	Trp	
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Arg	Asn	Val	Asp	Leu	Asn	Ser	Ile	Thr	Lys	Gln	Thr	Leu	Tyr	Thr	Met	
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gaa	gac	tct	cgc	gat	gag	cac	cgg	aaa	ctc	atc	acc	caa	tta	tat	cag	1213
Glu	Asp	Ser	Arg	Asp	Glu	His	Arg	Lys	Leu	Ile	Thr	Gln	Leu	Tyr	Gln	
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Glu	Phe	Asp	His	Leu	Leu	Glu	Glu	Gln	Ser	Pro	Ile	Glu	Ser	Tyr	Ile	
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gag	tgg	ctg	gat	acc	atg	gtt	gac	cgc	tgt	gtt	gtg	aag	gtg	gct	gcc	1309
Glu	Trp	Leu	Asp	Thr	Met	Val	Asp	Arg	Cys	Val	Val	Lys	Val	Ala	Ala	
	400					405					410					
aag	aga	caa	ggg	tcc	ttg	aag	aaa	gtg	gcc	cag	cag	ttc	ctc	ttg	atg	1357
Lys	Arg	Gln	Gly	Ser	Leu	Lys	Lys	Val	Ala	Gln	Gln	Phe	Leu	Leu	Met	
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tgg	tcc	tgt	ttc	ggc	aca	agg	gtg	atc	cgg	gac	atg	acc	ttg	cac	agc	1405
Trp	Ser	Cys	Phe	Gly	Thr	Arg	Val	Ile	Arg	Asp	Met	Thr	Leu	His	Ser	

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gtt	tat	ccc	cac	aga	gag	gaa	cat	gga	tac	acg	gga	agc	tat	aac	tat																	1885																																																			
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ggg	agc	tat	ggc	aac	cag	cat	cct	cac	ccc	atg	cag	agc	cag	tat	ccg																	1933																																																			
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Thr Pro Leu Thr Thr Arg Arg Asn Ser Glu Tyr Glu His Met Gln His	
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Phe Pro Gly Phe Ala Tyr Ile Asn Gly Glu Ala Ser Thr Gly Trp Ala	
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aaa tga ctgctatcat aggcatccat atttaatat atttaataata atttaataata	2325
Lys	
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 35 40 45

Asn Asn Arg Ala Ser Lys Pro His Ser Thr Pro Ala Thr Leu Gln Trp
 50 55 60

Leu Glu Glu Asn Tyr Glu Ile Ala Glu Gly Val Cys Ile Pro Arg Ser
 65 70 75 80

Ala Leu Tyr Met His Tyr Leu Asp Phe Cys Glu Lys Asn Asp Thr Gln
 85 90 95

Pro Val Asn Ala Ala Ser Phe Gly Lys Ile Ile Arg Gln Gln Phe Pro
 100 105 110

Gln Leu Thr Thr Arg Arg Leu Gly Thr Arg Gly Gln Ser Lys Tyr His
 115 120 125

Tyr Tyr Gly Ile Ala Val Lys Glu Ser Ser Gln Tyr Tyr Asp Val Met
 130 135 140

Tyr Ser Lys Lys Gly Ala Ala Trp Val Ser Glu Thr Gly Lys Lys Glu
 145 150 155 160

Val Ser Lys Gln Thr Val Ala Tyr Ser Pro Arg Ser Lys Leu Gly Thr
 165 170 175

Leu Leu Pro Glu Phe Pro Asn Val Lys Asp Leu Asn Leu Pro Ala Ser
 180 185 190

Leu Pro Glu Glu Lys Val Ser Thr Phe Ile Met Met Tyr Arg Thr His
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Cys Gln Arg Ile Leu Asp Thr Val Ile Arg Ala Asn Phe Asp Glu Val

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Pro Val Leu Gly Ser Ser Thr Val Val Asn Ile Val Gly Val Cys Asp 245 250 255		
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Gln Ala Leu Pro Asp Ser Leu Thr Gln Val Ile Arg Lys Phe Ala Lys 275 280 285		
Gln Leu Asp Glu Trp Leu Lys Val Ala Leu His Asp Leu Pro Glu Asn 290 295 300		
Leu Arg Asn Ile Lys Phe Glu Leu Ser Arg Arg Phe Ser Gln Ile Leu 305 310 315 320		
Arg Arg Gln Thr Ser Leu Asn His Leu Cys Gln Ala Ser Arg Thr Val 325 330 335		
Ile His Ser Ala Asp Ile Thr Phe Gln Met Leu Glu Asp Trp Arg Asn 340 345 350		
Val Asp Leu Asn Ser Ile Thr Lys Gln Thr Leu Tyr Thr Met Glu Asp 355 360 365		
Ser Arg Asp Glu His Arg Lys Leu Ile Thr Gln Leu Tyr Gln Glu Phe 370 375 380		
Asp His Leu Leu Glu Glu Gln Ser Pro Ile Glu Ser Tyr Ile Glu Trp 385 390 395 400		
Leu Asp Thr Met Val Asp Arg Cys Val Val Lys Val Ala Ala Lys Arg 405 410 415		
Gln Gly Ser Leu Lys Lys Val Ala Gln Gln Phe Leu Leu Met Trp Ser 420 425 430		
Cys Phe Gly Thr Arg Val Ile Arg Asp Met Thr Leu His Ser Ala Pro 435 440 445		
Ser Phe Gly Ser Phe His Leu Ile His Leu Met Phe Asp Asp Tyr Val 450 455 460		

Leu Tyr Leu Leu Glu Ser Leu His Cys Gln Glu Arg Ala Asn Glu Leu
 465 470 475 480

Met Arg Ala Met Lys Gly Glu Gly Ser Thr Ala Glu Val Arg Glu Glu
 485 490 495

Ile Ile Leu Thr Glu Ala Ala Ala Pro Thr Pro Ser Pro Val Pro Ser
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Phe Ser Pro Ala Lys Ser Ala Thr Ser Met Glu Val Pro Pro Pro Ser
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Ser Pro Val Ser Asn Pro Ser Pro Glu Tyr Thr Gly Leu Ser Thr Thr
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Gly Ala Met Gln Ser Tyr Thr Trp Ser Leu Thr Tyr Thr Val Thr Thr
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Ala Ala Gly Ser Pro Ala Glu Asn Ser Gln Gln Leu Pro Cys Met Arg
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Asn Thr His Val Pro Ser Ser Ser Val Thr His Arg Ile Pro Val Tyr
 580 585 590

Pro His Arg Glu Glu His Gly Tyr Thr Gly Ser Tyr Asn Tyr Gly Ser
 595 600 605

Tyr Gly Asn Gln His Pro His Pro Met Gln Ser Gln Tyr Pro Ala Leu
 610 615 620

Pro His Asp Thr Ala Ile Ser Gly Pro Leu His Tyr Ala Pro Tyr His
 625 630 635 640

Arg Ser Ser Ala Gln Tyr Pro Phe Asn Ser Pro Thr Ser Arg Met Glu
 645 650 655

Pro Cys Leu Met Ser Ser Thr Pro Arg Leu His Pro Thr Pro Val Thr
 660 665 670

Pro Arg Trp Pro Glu Val Pro Ser Ala Asn Thr Cys Tyr Thr Ser Pro
 675 680 685

Ser Val His Ser Ala Arg Tyr Gly Asn Ser Ser Asp Met Tyr Thr Pro
 690 695 700

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Met Leu Cys Gly Leu Leu Glu Glu
1 5
cct gac atg gat tcc aca gag agc tgg att gaa aga tgt ctg aac gaa 160
Pro Asp Met Asp Ser Thr Glu Ser Trp Ile Glu Arg Cys Leu Asn Glu
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agc gag agc aag cgc ttc tcc agc cac tct tct att gga aat att tcc 208
Ser Glu Ser Lys Arg Phe Ser Ser His Ser Ser Ile Gly Asn Ile Ser
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aac gac gaa aac gaa gag aag gaa aat aac cga gca tct aag cca cat 256
Asn Asp Glu Asn Glu Glu Lys Glu Asn Asn Arg Ala Ser Lys Pro His
45 50 55
tca aca cct gct aca tta caa tgg ttg gag gag aac tac gag atc gca 304
Ser Thr Pro Ala Thr Leu Gln Trp Leu Glu Glu Asn Tyr Glu Ile Ala
60 65 70
gag ggt gtg tgt att cct cgc atc gcc ctg tac atg cac tac ctg gac 352
Glu Gly Val Cys Ile Pro Arg Ile Ala Leu Tyr Met His Tyr Leu Asp
75 80 85
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Phe Cys Glu Lys Leu Asp Ser Gln Pro Val Asn Ala Ala Ser Phe Gly
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aag ata ata agg cag cag ttt cct cag ttg acc acg cgg aga tta gga 448
Lys Ile Ile Arg Gln Gln Phe Pro Gln Leu Thr Thr Arg Arg Leu Gly
105 110 115 120
act aga ggt caa tca aag tat cat tac tat ggc atc gca gtg aag gag 496
Thr Arg Gly Gln Ser Lys Tyr His Tyr Tyr Gly Ile Ala Val Lys Glu
125 130 135
agc tcc cag tac tac gat gtg atg tac tct aaa aag ggc gct gcg tgg 544
Ser Ser Gln Tyr Tyr Asp Val Met Tyr Ser Lys Lys Gly Ala Ala Trp
140 145 150

gtg aac gag acg ggc aag aaa gag gtc acc aaa cag aca gta gcg tat	592
Val Asn Glu Thr Gly Lys Lys Glu Val Thr Lys Gln Thr Val Ala Tyr	
155 160 165	
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Ser Pro Arg Ser Lys Leu Gly Thr Leu Leu Pro Asp Phe Pro Asn Val	
170 175 180	
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Lys Asp Leu Asn Leu Pro Ala Ser Leu Pro Glu Glu Lys Val Ser Thr	
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Phe Ile Met Met Tyr Arg Thr His Cys Gln Arg Ile Leu Asp Thr Val	
205 210 215	
ata cgc gcc aac ttc gat gag gtt cag agc ttc ctg ttg cac ttt tgg	784
Ile Arg Ala Asn Phe Asp Glu Val Gln Ser Phe Leu Leu His Phe Trp	
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Gln Gly Met Pro Pro His Met Leu Pro Val Leu Gly Ser Ser Thr Val	
235 240 245	
gtc aac ata gtg ggt gtg tgt gac tcc ata ttg tac aag gcc atc tca	880
Val Asn Ile Val Gly Val Cys Asp Ser Ile Leu Tyr Lys Ala Ile Ser	
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Gly Val Leu Met Pro Thr Val Leu Gln Ala Leu Pro Asp Ser Leu Thr	
265 270 275 280	
cag gtg atc agg aag ttt gcc aag cag ctg gac gag tgg ctg aag gtg	976
Gln Val Ile Arg Lys Phe Ala Lys Gln Leu Asp Glu Trp Leu Lys Val	
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gct tta cat gac ctg ccc gaa aac ctg cgc aac att aag ttt gaa ttg	1024
Ala Leu His Asp Leu Pro Glu Asn Leu Arg Asn Ile Lys Phe Glu Leu	
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tca aga aga ttt tct cag att ctc aaa cga caa aca tca tta aac cac	1072
Ser Arg Arg Phe Ser Gln Ile Leu Lys Arg Gln Thr Ser Leu Asn His	
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Leu Cys Gln Ala Ser Arg Thr Val Ile His Ser Ala Asp Ile Thr Phe	
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Gln Met Leu Glu Asp Trp Arg Asn Val Asp Leu Asn Ser Ile Thr Lys	
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caa act ctt tat act atg gaa gac tcc aga gaa gac cag agg aga ctc	1216
Gln Thr Leu Tyr Thr Met Glu Asp Ser Arg Glu Asp Gln Arg Arg Leu	
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Ile Ile Gln Leu Tyr Gln Glu Phe Asp Arg Leu Leu Glu Asp Gln Ser	
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Pro Ile Glu Ala Tyr Ile Glu Trp Leu Asp Ser Met Val Glu Arg Cys	
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Val Val Arg Val Ala Gly Lys Arg Pro Gly Ser Leu Lys Arg Val Ala	
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His Leu Met Phe Asp Asp Tyr Val Leu Tyr Leu Leu Glu Ser Leu His	
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Cys Gln Glu Arg Ala Asn Glu Leu Met Arg Ala Met Lys Gly Glu Gly	
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Thr Ser Thr Ser Pro Gly Pro Tyr Ser Pro Ala Lys Ser Val His Ser	
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Val Gly Val Pro Ala Val Gly Ser Pro Asn Ser Ala Gln Ser Pro Glu	
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Tyr Thr Ser Ile Ser Ala Thr Thr Gly Ala Val Gln Ser Tyr Thr Trp	
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Ser Ser Ala His Arg Met Pro Val Tyr Pro His Arg Asp Glu His Gly	
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Tyr Thr Gly Ser Tyr Asn Tyr Ser Ser Tyr Ala Asn Gln His His His	
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Pro	Leu	Leu	His	Ser	Ser	Pro	Val	Thr	Pro	Arg	Trp	Pro	Asp	Val	Pro		
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Ser	Thr	Gly	Asp	Met	Tyr	Ser	Pro	Leu	Ala	Pro	Arg	Arg	Arg	Asn	Ser	Glu	
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Tyr	Glu	His	Ala	Gln	His	Phe	Pro	Gly	Phe	Ala	Tyr	Ile	Asn	Gly	Glu		
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Ala	Thr	Thr	Gly	Trp	Ala	Lys											
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His Ser Ser Ile Gly Asn Ile Ser Asn Asp Glu Asn Glu Glu Lys Glu
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Asn Asn Arg Ala Ser Lys Pro His Ser Thr Pro Ala Thr Leu Gln Trp
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Leu Glu Glu Asn Tyr Glu Ile Ala Glu Gly Val Cys Ile Pro Arg Ile
 65 70 75 80

Ala Leu Tyr Met His Tyr Leu Asp Phe Cys Glu Lys Leu Asp Ser Gln
 85 90 95

Pro Val Asn Ala Ala Ser Phe Gly Lys Ile Ile Arg Gln Gln Phe Pro
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Gln Leu Thr Thr Arg Arg Leu Gly Thr Arg Gly Gln Ser Lys Tyr His
 115 120 125

Tyr Tyr Gly Ile Ala Val Lys Glu Ser Ser Gln Tyr Tyr Asp Val Met
 130 135 140

Tyr Ser Lys Lys Gly Ala Ala Trp Val Asn Glu Thr Gly Lys Lys Glu
 145 150 155 160

Val Thr Lys Gln Thr Val Ala Tyr Ser Pro Arg Ser Lys Leu Gly Thr
 165 170 175

Leu Leu Pro Asp Phe Pro Asn Val Lys Asp Leu Asn Leu Pro Ala Ser
 180 185 190

Leu Pro Glu Glu Lys Val Ser Thr Phe Ile Met Met Tyr Arg Thr His
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Cys Gln Arg Ile Leu Asp Thr Val Ile Arg Ala Asn Phe Asp Glu Val
 210 215 220

Gln Ser Phe Leu Leu His Phe Trp Gln Gly Met Pro Pro His Met Leu
 225 230 235 240

Pro Val Leu Gly Ser Ser Thr Val Val Asn Ile Val Gly Val Cys Asp
 245 250 255

Ser Ile Leu Tyr Lys Ala Ile Ser Gly Val Leu Met Pro Thr Val Leu
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Gln Ala Leu Pro Asp Ser Leu Thr Gln Val Ile Arg Lys Phe Ala Lys
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Asn Asn Arg Ala Ser Lys Pro His Ser Thr Pro Ala Thr Leu Gln Trp
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Met Leu Pro Val Leu Gly Ser Ser Thr Val Val Asn Ile Val Gly Val
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Cys Asp Ser Ile Leu Tyr Lys Ala Ile Ser Gly Val Leu Met Pro Thr
 165 170 175

Val Leu Gln Ala Leu Pro Asp Ser Leu Thr Gln Val Ile Arg Lys Phe
 180 185 190

Ala Lys Gln Leu Asp Glu Trp Leu Lys Val Ala Leu His Asp Leu Pro
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Glu Asn Leu Arg Asn Ile Lys Phe Glu Leu Ser Arg Arg Phe Ser Gln
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Ile Leu Arg Arg Gln Thr Ser Leu Asn His Leu Cys Gln Ala Ser Arg
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Thr Val Ile His Ser Ala Asp Ile Thr Phe Gln Met Leu Glu Asp Trp
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Arg Asn Val Asp Leu Asn Ser Ile Thr Lys Gln Thr Leu Tyr Thr Met
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Glu Asp Ser Arg Asp Glu His Arg Lys Leu Ile Thr Gln Leu Tyr Gln
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Glu Phe Asp His Leu Leu Glu Glu Gln Ser Pro Ile Glu Ser Tyr Ile
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Glu Trp Leu Asp Thr Met Val Asp Arg Cys Val Val Lys Val Ala Ala
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Lys Arg Gln Gly Ser Leu Lys Lys Val Ala Gln Gln Phe Leu Leu Met
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Trp Ser Cys Phe Gly Thr Arg Val Ile Arg Asp Met Thr Leu His Ser
 340 345 350

Ala Pro Ser Phe Gly Ser Phe His Leu Ile His Leu Met Phe Asp Asp
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Tyr Val Leu Tyr Leu Leu Glu Ser Leu His Cys Gln Glu Arg Ala Asn
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Glu Leu Met Arg Ala Met Lys Gly Glu Gly Ser Thr Ala Glu Val Arg
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Glu Glu Ile Ile Leu Thr Glu Ala Ala Ala Pro Thr Pro Ser Pro Val
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Pro Ser Phe Ser Pro Ala Lys Ser Ala Thr Ser Val Glu Val Pro Pro
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Pro Ser Ser Pro Val Ser Asn Pro Ser Pro Glu Tyr Thr Gly Leu Ser
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Thr Thr Gly Ala Met Gln Ser Tyr Thr Trp Ser Leu Thr Tyr Thr Val
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Thr Thr Ala Ala Gly Ser Pro Ala Glu Asn Ser Gln Gln Leu Pro Cys
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Met Arg Asn Thr His Val Pro Ser Ser Ser Val Thr His Arg Ile Pro
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Val Tyr Pro His Arg Glu Glu His Gly Tyr Thr Gly Ser Tyr Asn Tyr
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Gly Ser Tyr Gly Asn Gln His Pro His Pro Met Gln Ser Gln Tyr Pro
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Ala Leu Pro His Asp Thr Ala Ile Ser Gly Pro Leu His Tyr Ala Pro
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Tyr His Arg Ser Ser Ala Gln Tyr Pro Phe Asn Ser Pro Thr Ser Arg
 545 550 555 560

Met Glu Pro Cys Leu Met Ser Ser Thr Pro Arg Leu His Pro Thr Pro
 565 570 575

Val Thr Pro Arg Trp Pro Glu Val Pro Ser Ala Asn Thr Cys Tyr Thr
 580 585 590

Ser Pro Ser Val His Ser Ala Arg Tyr Gly Asn Ser Ser Asp Met Tyr
 595 600 605

Thr Pro Leu Thr Thr Arg Arg Asn Ser Glu Tyr Glu His Met Gln His
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Phe Pro Gly Phe Ala Tyr Ile Asn Gly Glu Ala Ser Thr Gly Trp Ala
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<213> Homo sapiens

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